

## ABSTRACT

[0043] A wavelength beam splitter (WBS) is combined with a conventional tunable filter to sequentially select different channels in a multi-channel communication system.' The WBS is characterized by a periodic spectral response with period equal to the channel spacing of the ITU grid. Preferably, the WBS consists of an optical cavity with an optical path length that produces a free-spectral range substantially equal to the channel spacing of the ITU grid. The WBS is used to separated the signal in each channel passband from the noise in the corresponding channel stopband. This provides a signal and a noise output for each channel. A tunable filter is used to scan the channels of the ITU grid sequentially and provide output signals for a single channel at a time. Therefore, a much smaller frequency bandwidth needs to be measured at a time and a less expensive detector may be used.